

# Investigating Behavior of Fitter

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# Question

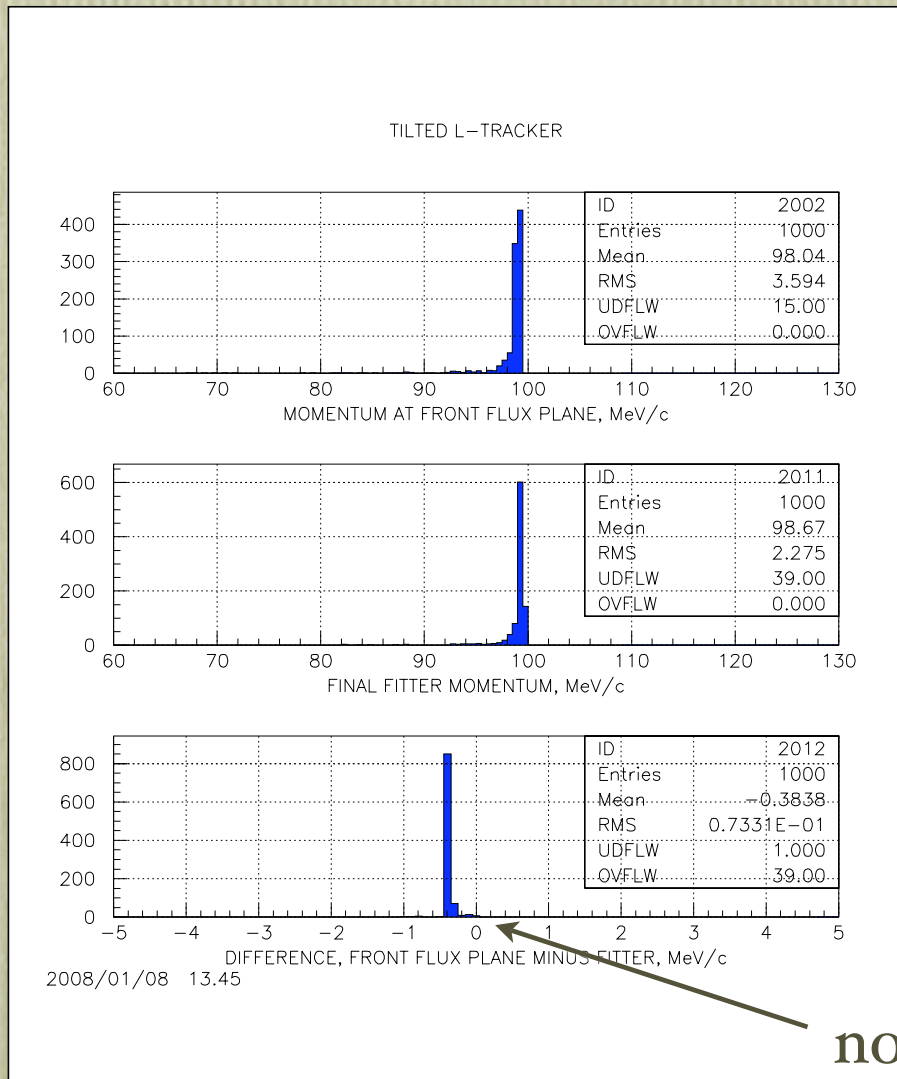
- Does the fitter have any biases?
- Why am I asking this?
  - looked at DIO, saw a mean shift of approximately 200 MeV from (true-reconstructed)



# What I Did

- Started eliminating effects: MS,  $dE/dx$ , etc.
- Changed tracker to vacuum: “spikier”
- *Big Change*: constraining vertex of DIO event in both transverse and longitudinal space
  - Target is 17 cylindrical segments every 5 cm: force event to occur in the middle and vary segment #

# What I See



initial  
(forced at 100 MeV  
before  $dE/dx$  in target,  
not turned off)

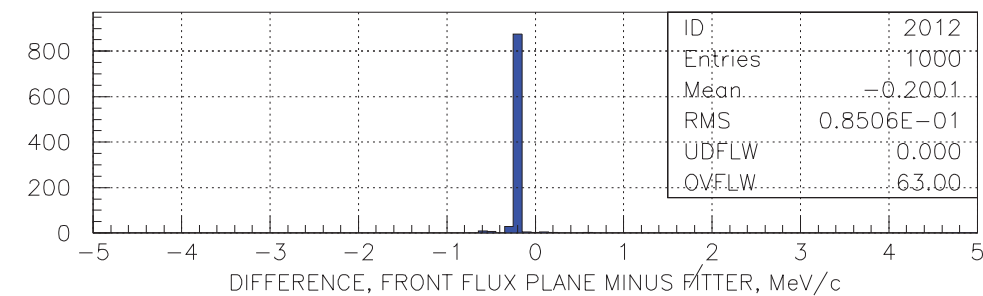
reconstructed

difference

not centered at zero

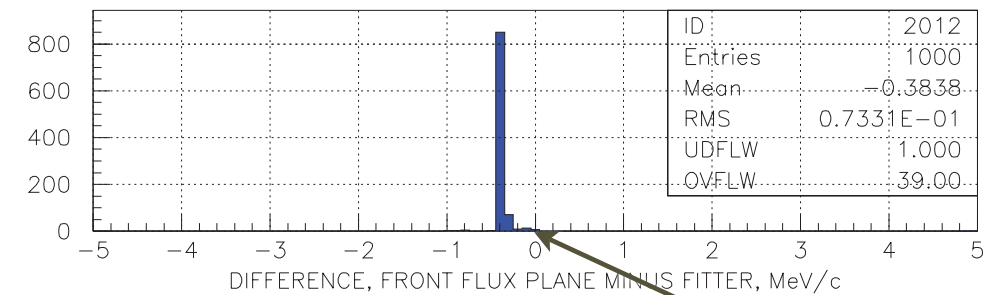


# Blow Up of Difference: diffs are diff



segment at 605

2008/01/08 13.25

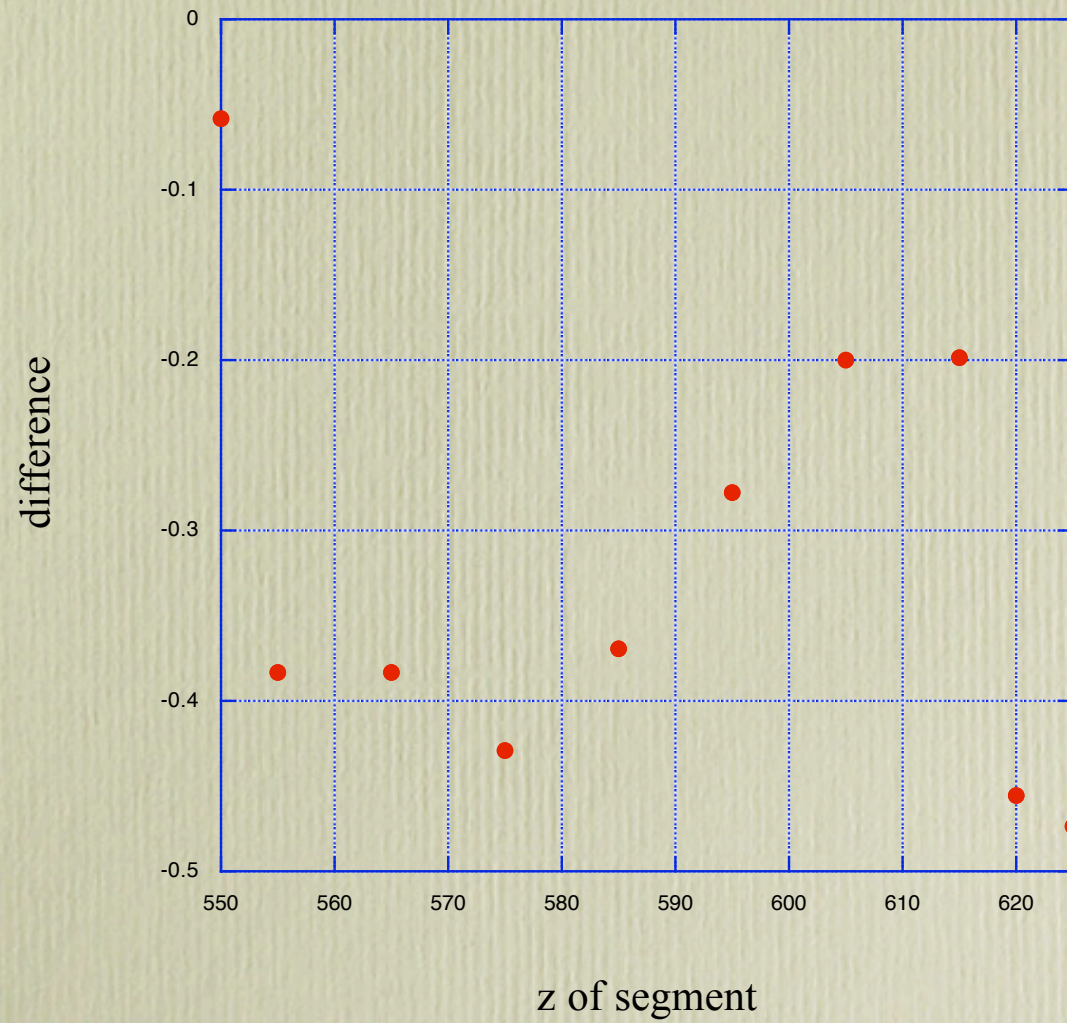


segment at 555

2008/01/08 13.45

not centered at zero

# Mean Diff vs Z of Segment





# What's Going On?

- Observe: if track originates in center of target segment, turn off as many extraneous processes as possible, get a “spike” in true-reconstructed that is dependent on the  $z$  of the segment
- Why: I don't know:
  - most likely: I'm doing something wrong
  - less likely: bug in fitter, flaw in algorithm, etc
- Next: figure it out